AMENDMENTS TO THE CLAIMS:

All pending claims are set forth below. Cancelled and withdrawn claims are indicated with claim number and status only. The claims as listed below show added text with underlining and deleted text with ~~strikethrough.~~ The status of each claim is indicated with one of (original), (currently amended), (previously amended), (cancelled), (withdrawn), (new), (previously added), (reinstated - formerly claim #), (previously reinstated), (re-presented - formerly dependent claim #), or previously re-presented). Please AMEND claims 2, 3, 10, 11, 13, 14, 17 and 21-23 and ADD new claims 24-26 in accordance with the following:

1. (withdrawn) A plasma etching method for etching a workpiece comprising:

placing the workpiece in a processing chamber defined by a reaction tube made of a dielectric material;

introducing a processing gas into the processing chamber;

supplying high frequency power to a high frequency antenna located outside the reaction tube, the high frequency antenna having a portion that has a relatively large capacitive coupling with the reaction tube;

generating a plasma in the processing chamber by the supplied high frequency power; and

moving at least one of the high frequency antenna and the reaction tube relative to the other.

2. (currently amended) A plasma etching apparatus comprising:

a reaction tube made of a dielectric material in the form of a cylinder;

a high frequency coil antenna located around the reaction tube ~~for generating~~ to generate a plasma inside the reaction tube, the high frequency coil antenna ~~having~~ including a portion that produces a relatively large capacitive coupling with the reaction tube~~,~~ and is formed between a power supply terminal connected to a plasma source high frequency power supply, and a ground terminal connected to a ground; and

a drive mechanism ~~for moving~~ to move at least one of the high frequency coil antenna and the reaction tube relative to the other ~~when performing~~ to perform plasma etching.

3. (currently amended) The plasma etching apparatus according to claim 2, wherein the high frequency coil antenna includes a plurality of winding portions, and the portion that produces a relatively large capacitive coupling with the reaction tube includes ~~and~~ a sloped

segment continuously formed between two of the plurality of winding portions in series, and the sloped segment is located closer to the reaction tube than the plurality of winding portions ~~for connecting the plurality of winding portions to one another in series~~.

4. (withdrawn) The plasma etching apparatus according to claim 3, wherein the thickness of the sloped segment increases at locations closer to the grounding terminal.

5. (withdrawn) The plasma etching apparatus according to claim 2, further comprising a rotary connector having a center shaft that is coaxial with the reaction tube, the rotary connector having an output unit rotatably supported by the center shaft and connected to the power supply terminal, the plasma source high frequency power supply being connected to the center shaft.

6. (withdrawn) The plasma etching apparatus according to claim 5, wherein the center shaft is a hollow shaft, and the etching apparatus further comprises:

a gas introducing port in communication with the hollow shaft for introducing the processing gas from above the processing chamber; and

a temperature sensor cable, which passes through the hollow shaft for adjusting the temperature in the processing chamber.

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7. (previously amended) The plasma etching apparatus according to claim 2, wherein the portion that produces a relatively large capacitive coupling with the reaction tube is located closer to the reaction tube than the remaining portion of the high frequency coil antenna.

10. (previously amended) The plasma etching apparatus according to claim 2, further comprising a controller connected to the drive mechanism ~~for controlling~~ to control a relative moving speed between the high frequency coil antenna and the reaction tube.

11. (currently amended) A plasma processing apparatus comprising:

a processing chamber ~~for performing~~ to perform a predetermined process on a workpiece;

a reaction tube connected to the processing chamber, the reaction tube being made of a dielectric material in the form of a cylinder;

a high frequency coil antenna located around the reaction tube ~~for generating~~ to

generate a plasma inside the reaction tube, the high frequency coil antenna ~~having~~ including a portion that produces a relatively large capacitive coupling with the reaction tube and is formed between, a power supply terminal connected to a plasma source high frequency power supply and a ground terminal connected to a ground; and

a drive mechanism ~~for moving~~ to move at least one of the high frequency coil antenna and the reaction tube relative to the other ~~when performing~~ to perform the process on the workpiece.

12. (withdrawn) The apparatus according to claim 11, further comprising a rotary connector having a center shaft that is coaxial with the reaction tube, the rotary connector having an output unit rotatably supported by the center shaft and connected to the power supply terminal, the plasma source high frequency power supply being connected to the center shaft.

13. (currently amended) A plasma etching apparatus comprising:

an etching chamber ~~for accommodating~~ to accommodate a workpiece;

a reaction tube connected to the etching chamber, the reaction tube being made of a dielectric material in the form of a cylinder;

a coil antenna surrounding an outer wall of the reaction tube, the coil antenna including a first winding, a second winding, and an intermediate segment continuously formed between ~~connecting~~ the first winding ~~to~~ and the second winding in series;

a plasma generating power supply ~~for supplying~~ to supply high frequency power to the coil antenna; and

a drive mechanism ~~for moving~~ to move at least one of the coil antenna and the reaction tube relative to the other ~~when performing~~ to perform plasma etching on the workpiece, wherein the intermediate segment is located closer to an outer peripheral surface of the reaction tube than the first winding and the second winding.

14. (currently amended) The plasma etching apparatus according to claim 13, wherein the first winding and the second winding are parallel with each other and the intermediate segment is inclined with respect to the first winding and the second winding.

15. (withdrawn) The plasma etching apparatus according to claim 13, wherein the intermediate segment is thicker than the first winding and the second winding.

16. (withdrawn) The plasma etching apparatus according to claim 13, wherein an area of the intermediate segment that faces
the reaction tube is larger than areas of the first winding and the second winding that faces the reaction tube.

17. (previously amended) The plasma etching apparatus according to claim 13, further comprising a controller connected to the drive mechanism ~~for controlling~~ to control a relative moving speed between the coil antenna and the reaction tube.

18. (previously amended) The plasma etching apparatus according to claim 13, wherein the drive mechanism rotates the coil antenna around the reaction tube.

19. (withdrawn) The plasma etching apparatus according to claim 13, further comprising a rotary connector having a center shaft that is coaxial with the reaction tube, the rotary connector having an output unit rotatably supported by the center shaft and connected to the power supply terminal, the plasma source high frequency power supply being connected to the center shaft.

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20. (withdrawn) The plasma etching apparatus according to claim 19, wherein the center shaft is a hollow shaft, and the etching apparatus further comprises:

a gas introducing port in communication with the hollow shaft for introducing the processing gas from above the processing chamber; and

a temperature sensor cable, which passes through the hollow shaft for adjusting the temperature in the processing chamber.

21. (currently amended) The plasma etching apparatus according to claim 3, wherein the sloped segment is wound ~~around approximately one fourth of a circumference of a~~ approximately one-fourth of a way around the peripheral surface of the reaction tube.

22. (currently amended) The plasma etching apparatus according to claim 21, wherein each of the windings is wound ~~around~~ approximately three-fourths of a way around the ~~circumference of the~~ peripheral surface of the reaction tube.

23. (currently amended) A plasma etching apparatus comprising:

a reaction tube made of a dielectric material in a form of a cylinder; and

a high frequency coil antenna, located around the reaction tube, to generate a plasma inside the reaction tube, the high frequency coil antenna ~~having~~ including a portion that produces a relatively large capacitive coupling with the reaction tube and is formed between~~,~~ a power supply terminal connected to a plasma source high frequency power supply and a ground terminal connected to a ground.

24. (new) An inductively coupled plasma etching apparatus comprising:

a cylindrical reaction tube made of a dielectric material;

an antenna located around the reaction tube to generate and maintain an inductively coupled plasma inside the reaction tube, the antenna including:

a first winding connected to a power supply;

a second winding connected at a ground; and

a capacitive coupling segment continuously formed between the first winding and the second winding to produce a relatively large capacitive coupling with the reaction tube, wherein the first winding, the capacitive coupling segment and the second winding form a coil; and

a drive mechanism to move at least one of the antenna and the reaction tube relative to the other to perform plasma etching.

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25. (new) The inductively coupled plasma etching apparatus according to claim 24, wherein the capacitive coupling segment is located closer to the reaction tube than the first winding and the second winding.

26. (new) An inductively coupled plasma etching apparatus comprising:

a reaction tube; and

a coil antenna, located around the reaction tube and having a deformed portion that, upon moving at least one of the antenna and the reaction tube relative to the other to perform plasma etching, is capacitively coupled to cause an ion sheath to form along an inner wall surface of the reaction tube to decrease attachment of plasma etching products to the inner wall surface of the reaction tube.